first removed become almost perfect females; others with longer and longer periods of attachment become more and more perfect males.

The general idea, then, is that "sexually differentiated organisms, from the first, have had the problem of producing germs pitched at two different metabolic levels." In connection with the establishment of these two metabolic levels (which appear to us to be also illustrated by variational alternatives quite apart from those of sex), the germ-cells have sometimes at least produced two different chromosome complexes. "But, as we have seen, the requisite metabolic level of the germ may be established in the absence of the appropriate chromosome complex, and the sex of the offspring made to correspond with the acquired grade or level of metabolism." Sex is plastic, reversible, quantitative in nature. "Seemingly this can only mean that other hereditary characters are also modifiable." Dr. Riddle has made a very notable contribution towards the solution of a long-standing problem.

NOTES.

THE mastership of Trinity College, Cambridge, is in the gift of the Crown, and to this post, vacant by the recent death of Dr. Butler, Sir J. J. Thomson has been appointed. No fellow of that great house has had a more distinguished career, and his appointment was not unexpected. He is the first layman to hold the office. Three other fellows of the Royal Society are heads of Cambridge colleges, namely, Dr. A. E. Shipley, Christ's; Dr. H. K. Anderson, Gonville and Caius; and Prof. A. C. Seward, Downing. "J. J.," as he is commonly called, was born just over sixty-one years ago, entered Trinity in 1876, was made a lecturer of his college in the same year in which he took his M.A. degree, and shortly afterwards, at the early age of twenty-seven, was appointed Cavendish professor at Cambridge in succession to Lord Rayleigh. His success in developing the Cambridge school of mathematical and experimental physics must be familiar to all readers of NATURE, and there is scarcely any civilised country which has not sent students to work under him in his laboratory. The brilliant researches carried on there were surveyed in NATURE of March, 1913, when Sir Joseph Thomson was the subject of an article in our series of "Scientific Worthies." In 1905 Sir Joseph Thomson was appointed professor of physics at the Royal Institution, and was awarded a Nobel prize for physics in the following year. He was president of the British Association in 1908, and four years later received the coveted distinction of the Order of Merit. In 1915 he was elected president of the Royal Society, and now his academic course is crowned by the headship of the leading college in his University. This is not the place to describe Sir Joseph Thomson's discoveries. It is more interesting to turn to the future. He is a ready speaker, a good talker, has the "saving grace" of humour, is popular, and knows and is known by all physicists and most chemists. He has now a great opportunity, and we predict with confidence that, aided by his wife, his rule in Trinity will add further lustre to his career, and bring university society into ever closer touch with leaders of scientific thought in Europe and America.

PROF. W. W. WATTS, professor of geology at the Imperial College of Science and Technology, has been elected a member of the Athenæum Club under the provisions of the rule which empowers the annual election by the committee of a certain number of persons "of distinguished eminence in science, literature, the arts, and for public service."

SIR NAPIER SHAW, director of the Meteorological Office, has been elected a foreign honorary member of the American Academy of Arts and Sciences, Boston.

WE regret to announce the death on February 7, in his seventy-first year, of Prof. G. A. L. Lebour, professor of geology in Armstrong College (formerly Durham College of Science), Newcastle-upon-Tyne, since 1879, and vice-principal of the college since 1902.

THE Perkin Medal Committee, consisting of members of several chemical societies, has, says *Science*, awarded the Perkin medal for 1918 to Auguste J. Rossi, of Niagara Falls, New York, in recognition of his work on titanium.

THE death is announced, at eighty-six years of age, of Prof. G. P. Girdwood, professor of chemistry in the faculty of medicine of McGill University, Montreal, from 1869 to 1902.

AT the ordinary scientific meeting of the Chemical Society, to be held at Burlington House, W.1, on Thursday, February 21, at 8 p.m., the Hon. R. J. Strutt will deliver a lecture entitled "Recent Studies on Active Nitrogen."

WE learn from *Science* that the Nichols medal for meritorious research in organic chemistry has been conferred on Prof. T. B. Johnson, of the Sheffield Scientific School of Yale University. The medal is awarded annually by the New York Section of the American Chemical Society on the merit of the original communications published in the journal of the society.

THE following officers and other members of council were elected at the annual meeting of the Malacological Society on February 8:—*President*, J. R. le B. Tomlin; *Vice-Presidents*, Rev. A. H. Cooke, A. Reynell, Tom Iredale, and H. O. N. Shaw; *Treasurer*, R. Bullen Newton; *Secretary*, G. K. Gude; *Editor*, B. B. Woodward; *Other Members of Council*, A. S. Kennard, Charles Oldham, G. B. Sowerby, A. E. Salisbury, E. R. Sykes, and W. J. Wintle.

THE officers and ordinary members of council of the Royal Microscopical Society, elected for the ensuing year, are as follows:—*President*, J. E. Barnard; *Vice-Presidents*, E. Heron-Allen, F. Martin Duncan, A. Earland, and R. Paulson; *Treasurer*, C. F. Hill; *Secretaries*, Dr. J. W. H. Eyre and D. J. Scourfield; *Ordinary Members of Council*, A. N. Disney, Dr. R. G. Hebb, T. H. Hiscott, Dr. Benj. Moore, Dr. J. Milton Offord, P. E. Radley, E. J. Sheppard, A. W. Sheppard, Dr. C. Singer, C. D. Soar, J. Wilson, and B. B. Woodward; *Librarian*, P. E. Radley.

THE twelfth award of the Reuben Harvey triennial memorial prize of the Royal College of Physicians of Ireland will be made on July 1 next. The competition is open to all students of the various recognised schools of medicine in Dublin, and to graduates or licentiates of the medical licensing bodies in Ireland of not more than three years' standing. The essays must show original research in animal physiology or pathology, be illustrated by drawings or preparations, and reach the registrar of the Royal College of Physicians of Ireland, Kildare Street, Dublin, not later than June 1.

MISS EDITH H. MARTYN records from Cheltenham the appearance of a fine peacock butterfly (*Vanessa Io*) on February 8. Though Blomefield, in his

"Naturalist's Calendar," gives February 28 as the earliest date of occurrence of this butterfly near Cambridge, it is not unusual for specimens to be seen in the south of England several weeks earlier. Two peacock butterflies were seen by the present writer near Arundel, Sussex, a fortnight before the date of Miss Martyn's record. They were no doubt insects which had hibernated and had been stirred into flight by the warm sunshine.

AT the anniversary meeting of the Royal Astronomical Society held on February 8 the officers and council were elected as follows:—*President,* Maj. P. A. MacMahon; *Vice-Presidents,* Prof. A. S. Eddington, Dr. J. W. L. Glaisher, Prof. R. A. Sampson, and Prof. H. H. Turner; *Treasurer,* Mr. E. B. Knobel; *Secretaries,* Dr. A. C. D. Crommelin and Prof. A. Fowler; *Foreign Secretary,* Dr. A. Schuster; *Council,* Mr. A. E. Conrady, the Rev. A. L. Cortie, S.J., Dr. J. L. E. Dreyer, Sir F. W. Dyson, Col. E. H. Hills, Mr. J. H. Jeans, Mr. H. S. Jones, Mr. E. W. Maunder, Dr. W. H. Maw, Prof. H. F. Newall, Prof. J. W. Nicholson, and the Rev. T. E. R. Phillips.

THE possibility of producing from home sources, hitherto neglected, a certain proportion of the vast amount of mineral oil and its kindred products, now so vital a necessity to our national existence, has been much discussed for some time past in both the general and technical Press. Particular interest, therefore, is attached to the paper entitled "A New British Oil Industry," by Mr. E. H. Cunningham Craig, Dr. F. Mollwo Perkin, Mr. A. G. V. Berry, and Dr. A. E. Dunstan, to be read at the meeting of the Institution of Petroleum Technologists on February 19, at 8 p.m., at the house of the Royal Society of Arts, Adelphi, W.C.2. The president of the institution, Mr. C. Greenway, will occupy the chair.

THE council of the Paisley Philosophical Institution has decided to initiate a special research section, and to equip a laboratory for the use of members who desire practically to investigate problems of geology and biology. The institution has a practical interest in the well-equipped Coats's Observatory, in which research in astronomy and meteorology is provided for. It possesses, also, an outfit for the encouragement of photography. Members are to be at liberty to join the new section by payment of an additional subscription. The satisfactory equipment of the laboratory will cost money; and this has to be found. The institution has a small reserve fund, but it is proposed to raise a special fund of 150*l.* by subscription, and towards this Mr. Robert Russell, a vice-president, has given 50*l.*

IN a report presented to the Imperial Institute Committee for Australia on the recent work of the institute for the Commonwealth, particulars are given of the results of an investigation into a series of oils prepared during the Australasian Antarctic Expedition and forwarded to the institute by Sir Douglas Mawson. These materials included sea-leopard oil, Weddell seal oil, and penguin oil. The oils have been carefully examined in the Scientific and Technical Department of the Imperial Institute in order to determine their characters in comparison with commercial oils of a similar kind, and have also been submitted to buyers of such oils in the United Kingdom. The oils were of good quality, and could be utilised for the purposes to which commercial seal and whale oils are applied, viz. for soap-making, leather-dressing, burning, etc. There is no doubt that there would be a ready sale for consignments of any of these oils at about the current price of whale and seal oils if they should become available in commercial quantities.

PROF. MAGNUS MACLEAN, of Glasgow, gave the Kelvin lecture to the Institution of Electrical Engineers on February 7. He took for his subject Kelvin as a teacher; and as he was for fifteen years Lord Kelvin's official assistant at Glasgow University, he threw many interesting sidelights on the everyday life of the great physicist. The lecture consisted mainly of extracts from Kelvin's letters to his assistant, generally giving him instructions to carry out researches. They all show intense eagerness to extend the boundaries of our knowledge of physical science and impatience at the length of time requisite to carry out the necessary experiments. Kelvin's experiments on electric fuses in 1886 and on "ampere gauges" (ammeters) in 1888 showed how he almost intuitively knew the difficulties that would arise, and apparently that he never was at a loss for methods of obviating these difficulties. In connection with his ampere gauges, for instance, he suggested that they might be made "dead heat" by means of a dash-pot. His first suggestion for making the latter was a metal plate dipping into a solution of sugar in water contained in a test-tube, as by this means any desired amount of viscosity could be obtained. Prof. Maclean also stated that Kelvin never regarded seriously any suggestions for "rationalising" our system of electric units. In fact, he regarded the proposals as "frivolous nonsense."

IN the old days electricians used to regard a "magneto" as a toy dynamo, and thought that it would be beneath the dignity of a first-rate designer to suggest improvements. Now neither labour nor expense is being spared in order to perfect it. Before the war there were only two or three firms in this country which made magnetos; there are now at least twenty times as many. As most of the pre-war magnetos came from Germany, our manufacturers were hard put to it in the early days of the war, and many of them slavishly followed the well-known design patented by Bosch. Great improvements were soon made by the British engineers in the ignition circuit, and there are now many types of magneto which are greatly superior to the Bosch. There is still a great demand for further improvements, but the engineer finds it difficult to determine whether he has to design for a minimum amount of energy or for a big potential gradient in the sparking-plug, and this hinders progress. The Students' Section of the Institution of Electrical Engineers ably discussed this question at a meeting at Faraday House on February 8, when Mr. R. W. Corkling read a paper on magnetos. Mr. Corkling showed all the latest types of magneto. He gave a full description of the one taken from a Zeppelin brought down in this country in 1916; its finish and accuracy of manufacture left little to be desired, but the design was poor. Mr. James, the vice-chairman of the section, suggested that the problem of "jamming" the ignition circuit of an enemy aeroplane by a suitable wireless method ought not to be an insuperable one; men of science had solved much more difficult problems in the past. There was a large number of youthful electricians present, who all took the greatest interest in the proceedings.

AN account of the life and mathematical work of Giuseppe Veronese is given by Prof. Corrado Segre in the *Atti dei Lincei,* vol. xxvi., (2), 9. Born at Chioggia on May 7, 1854, the son of a small painter, Veronese early showed a taste for art, which he later cultivated as a hobby, but after studying at the technical schools in Chioggia and Venice (where he partly supported himself by copying and giving lessons), Veronese went to Vienna, undertaking work there in connection with the Danube and designs for the exhibition. A year later he went to the Polytechnic at Zurich, studying mechanics at first, and then pure mathematics under Fiedler. Here he became interested in the work of Steiner, and sought to investigate the properties of the Pascal lines of the sixty hexagrams formed by joining up six points in every possible way. In 1876 Veronese asked to study at Rome under Cremona and Battaglini, where he was soon appointed assistant lecturer in projective geometry. His work on the hexagram was published in April, 1877, and some years later the Lincei published two memoirs by him on certain configurations in planes and in space. In 1880–81 Veronese went to Leipzig under Klein, and published an important memoir in German on the geometry of hyperspaces, and this was followed by further writings on this and kindred subjects. In October, 1881, he succeeded to the chair of geometry at Padua, and it is noteworthy that his predecessor, Bellavitis, was a disbeliever in the new-fangled "geometrical aberrations," as he styled the studies in which Veronese revelled. In addition to more advanced work, Veronese was the author of a successful treatise on elementary geometry. He appears, however, to have had a practical side to his character entirely distinct from his more abstruse studies, for he occupied himself assiduously with hydrographical problems with special, but not exclusive, reference to the Venetian lagoons. In addition, he served on the Municipal Council, and in 1904 was nominated Senator, in which capacity he made many important speeches. He was one of the first and most enthusiastic supporters of the war, but unfortunately his health had begun to break down in 1911–12 as the result of influenza, and he died on July 17 of last year.

THE third report of the Committee for the Exploration of the Irish Caves has just been issued by the Royal Irish Academy (Proceedings, vol. xxxiv., Sect. B, No. 3). It deals with the Castlepook Cave, Co. Cork, which was excavated under the direction of the late Mr. R. J. Ussher, and yielded more than 30,000 bones and teeth. A description of the cave by Mr. Ussher himself shows that it originated by the usual widening of joints in the Carboniferous Limestone, and the deposits on the floor consist not only of cave earth (decomposed limestone) and stalagmite, but also of sand and stones introduced by running water. As pointed out by Prof. H. J. Seymour, all the stones are of local origin, while many of those in the Boulder Clay of the surrounding country have been brought from a long distance. It therefore seems probable that the deposits containing the bones of animals which no longer live in Ireland are pre-Glacial. There is no evidence that the cave was ever occupied by man—indeed, it seems to have been always too damp for human habitation; but, as shown by abundance of remains in the lowest layer of the floor, it was at first frequented by a large variety of the brown bear, and, as equally evident from numerous bones and coprolites in the second layer, it then became a den of spotted hyænas. These animals introduced into the cave an immense number of bones of the reindeer and some young individuals of the mammoth. Among them are also numerous remains of the Scandinavian lemming and a new species related to the Arctic lemming. In later deposits there are bones and teeth of domesticated animals, which have been introduced partly by foxes, partly by accidental falls from above. Dr. R. F. Scharff, who describes the mammalian remains, emphasises the importance of the discovery of the cave hyæna in Ireland, and the interest of the proof that it was a contemporary of the reindeer.

THE classification and study of the anaerobic bacteria of war wounds is the subject of a report by Dr. James McIntosh, published by the Medical Research Committee (Special Report Series, No. 12, 1917). Infection of wounds by this class of organisms has been very common in the present war, and some of the resulting complications, such as gas gangrene, are very dangerous. A good deal of confusion and uncertainty has hitherto existed as to the particular micro-organisms involved on account of the great difficulty of isolating them in pure culture. In the investigations detailed in the present memoir Dr. McIntosh has used elaborate precautions to establish really pure cultures as surface growths. This has been accomplished by the use of palladium-black as a means for obtaining anaerobic conditions—a method elaborated by Dr. McIntosh and Dr. Fildes. Some nineteen types of anaerobic bacteria are fully described, of which seventeen were isolated from wounds. The memoir is illustrated with fifteen plates, and Dr. Fildes contributes an account of the principles involved in anaerobic cultivation. The publication of this valuable and important piece of work is particularly opportune at the present time.

MR. GILBERT ARROW, in the *Entomologists' Monthly Magazine* for January, gives a brief account of the life-history of one of the Coccinellid beetles (*Scymnus capitatus*), including what appears to be the first accurate figure yet published of the larva. "It is interesting to note," he remarks, "that before attaining the fully mature condition the freshly developed beetle passes through stages of pigmentation which are represented in allied species of Scymnus."

A NORTHWARD extension of the range of the purple sea-urchin (*Strongylocentrotus lividus*) is recorded in the *Irish Naturalist* for January by Mr. W. F. Johnson, who gives a brief description of specimens taken from the Island of Inishkeel, Co. Donegal. At Bundoran, where this species occurs in some numbers, it lives in cup-shaped hollows excavated in the surface of the rock. The specimens found at Inishkeel seem in no case to have made similar excavations, from which it is inferred that they have but lately established themselves. Both the purple and the reddish varieties were found.

UNTIL now the white-winged black tern (*Hydrochelidon leucoptera*) has been extremely rare in Australia, but during Easter of 1917 it was found in great numbers along the west coast so far south as Fremantle—a thousand miles south of its normal winter range. It would seem that the birds followed the trail of a dragonfly (*Hemianax papuensis*), which, during this time, was to be seen in myriads. On these the birds were feeding. This occurrence is one of quite peculiar interest, not merely to ornithologists, but also to students of migration generally, who will find an admirable summary of the occurrence in the *Emu* for October last, which has just reached us.

THE Ipswich and District Field Club is fortunate in securing for its Journal (vol. v., for 1916, published November, 1917) a paper by Prof. P. G. H. Boswell, dealing with the Palæozoic floor as revealed by borings in East Anglia. Details of wells and borings for water made in Suffolk since 1906 are appended, as a supplement to those recorded in the Memoirs of the Geological Survey.

THE Summary of Progress of the Geological Survey of Great Britain for 1916 includes details of deep borings made for coal and ironstone near Dover and Folkestone, the cores from which have been in large part examined by the officers of the Survey. Mr. Lamplugh records the details of a boring made at Battle in 1907–8 from near the top of the Wealden Ashdown Sand to the base of the Kimmeridge series, a total depth of 2071 ft. A useful educational section is given, showing our knowledge of the floor of eroded Carboniferous rocks that underlies eastern Kent.

MR. C. A. COTTON, of Wellington, N.Z., contributes to the *American Journal of Science* (vol. xliv., p. 249, 1917) a paper illustrated by numerous diagrams on "Block Mountains in New Zealand." This is in part a summary of his previous work, and is accompanied by an important bibliography. The expository methods of Prof. W. M. Davis are utilised, and fault-scarps, in various stages of maturity, are traced as the margins of block-masses throughout central Otago. The importance of tors as measures of the amount of erosion of a land-surface is usefully pointed out.

SEVERAL changes have been instituted in the Monthly Meteorological Chart of the Atlantic Ocean beginning with the January number for this year. The part which refers to the Mediterranean has been discontinued and replaced by inset maps showing the mean annual rainfall and the mean rainfall of the current month over Nigeria. To the coast line of the great American lakes the results of observations for pressure, air, and sea temperature and currents are added. Among other changes and additions there is a map showing the distribution of specific gravity. The similar monthly chart of the Indian Seas has also undergone some changes, and now includes a large-scale map of the China Sea, showing the distribution of pressure, air, and sea temperature.

THE rainfall of 1917 in the British Isles was about the average, but large areas of deficient rainfall occurred in all parts of the country. According to *Symons's Meteorological Magazine* for January (vol. lii., No. 624) the most important of these areas were in the centre, part of the north, and the south-west of England, all of which had deficiencies of more than 10 per cent. The east midlands of Scotland were also dry, the deficiency exceeding 20 per cent. over an area extending from the Firth of Forth to the Grampians. The southern half of Ireland and the extreme north and the south of Wales had a rainfall below the average. Unusually wet regions included the west and north of Scotland, the north of Ireland, the Yorkshire Wolds, Cardigan Bay, and the London district. August, October, and November showed a general excess of rainfall over the country. May was rather wet in Ireland and June in England, especially locally. February and December were unusually dry, and there was, on the whole, a general deficiency of rainfall during the first seven months of the year.

PART I of vol. xxx. of the Proceedings of the Physical Society of London is exceptionally strong in optical papers. Mr. T. H. Blakesley points out the convenience of representing a simple lens by a point on a plane diagram in which the co-ordinates are the quotients of the two radii of curvatures of the two bounding surfaces by the thickness of the lens at its middle point. Lenses having some particular property are then represented on the diagram by the points on some line which in many cases turns out to be straight. Mr. T. Smith and Miss Dale, of the National Physical Laboratory, show that the mechanically strong triple-cemented objective may with advantage be substituted for the non-cemented doublet of flint and crown glass at present usual in small telescopes. Such triple objectives, it is shown, can be designed with the first-order spherical aberration and coma zero and the second order small, and these conditions do not necessarily limit the lens surfaces to those of small curvature.

WITH reference to the possible risk involved in the use and transportation of celluloid articles, an investigation into the effects of heat upon such articles was carried out by the U.S. Bureau of Standards in 1907. In view of the present interest in nitro-cellulose products it has recently been thought desirable to publish the results, which are now given in Technologic Paper No. 98, issued by the bureau. The chief conclusions arrived at were that when celluloid is exposed to heat, decomposition commences at temperatures in the neighbourhood of 100° C., and above 170° the decomposition takes place with explosive violence. If loss of heat by radiation is prevented, the heat of decomposition at temperatures of about 120° to 135° may raise the temperature of the mass to the ignition point; and momentary contact with bodies having a temperature of 430°—below visible red-heat—may ignite celluloid articles. The rate of combustion was found to be from five to ten times that of paper, pine-wood, or poplar wood of the same dimensions and burning under the same conditions. Nitro-cellulose exists and reacts as such in celluloid, and the rate of its decomposition when heated is not diminished by admixture with zinc oxide (a common ingredient of celluloid products) in proportions up to 20 per cent. There appears to be no good evidence that celluloid articles often inflame spontaneously, or that they are directly explosive under any conditions. The vapours evolved by decomposition are poisonous and extremely combustible, and may be ignited by the heat of decomposition of the celluloid itself. The decomposition is autocatalytic, and while not necessarily explosive, it may readily approach that condition as a limit.

IN the *Journal of Geology*, vol. xxv., p. 629, 1917, Prof. L. V. King, of McGill University, discusses the internal friction and limiting strength of rocks under conditions of stress such as exist within the earth. Taking his data from Adams and Bancroft's experiments on the effect of intense end pressures applied to small rock specimens enclosed in nickel-steel cylindrical jackets, he shows that a simple theoretical treatment of the elastic stage suffices to explain the mode of shearing rupture observed in the rock and the enclosing jackets. His main purpose, however, is to test Navier's modification of Tresca's theory that a stressed solid would commence to flow (without rupture) as soon as the maximum shearing stress exceeded a limiting value K characteristic of the solid; Navier's hypothesis replaced K by $K+\mu N$, where N is the stress normal to the shearing plane, while μ is a coefficient of internal friction. Prof. King concludes, from the work of Adams and Bancroft, that for some kinds of rocks constants K and μ do exist, although the theory does not lead to very accordant values from different sets of experiments. In some cases, while the limit of plasticity certainly increases with the hydrostatic pressure, the internal friction does not seem to be simply proportional to the normal stress; this was particularly so for some of the hardest rocks, such as dolomite, which appear to possess great internal friction. These conclusions have an important bearing on questions of geology and geodynamics. Sir G. Darwin estimated that under the continents of Africa and America the strain must be so great that marble would break under it, though *strong* granite would stand. This was based on the limiting stresses found from ordinary crushing tests, but it now appears that the limiting stress will be much greater at considerable depths, owing to the great hydrostatic pressure. It is suggested that great movements of the earth's crust have mainly proceeded by slow and gradual adjustment, rather than by series of cataclysmal collapses.

In the study of the chemical actions involved in the dissolution of gold by sodium cyanide solutions it is necessary to know the extent of the hydrolysis of the latter, because it has been shown that this is an important factor in the rate of dissolution. An ingenious method for the estimation of the degree of hydrolysis of sodium cyanide solutions has been devised by Messrs. F. P. Worley and V. R. Browne (Chemical Society's Journal for December). A set of three flasks and three test tubes is set up in such a way that a current of air can be aspirated through all six vessels, the flasks alternating with the test-tubes. The latter contain an alkaline solution of sodium picrate; the first flask contains hydrocyanic acid of one concentration, the second the sodium cyanide solution, and the third hydrocyanic acid of a second concentration. The depth of the reddish-brown colour produced in the picrate indicator solution depends on the concentration of hydrogen cyanide vapour in the air current. Consequently, by varying the concentration of the hydrocyanic acid solutions until one is found which gives the same intensity of colour as the sodium cyanide solution, the concentration of hydrocyanic acid which has the same hydrogen cyanide pressure as the sodium cyanide solution is determined. It was shown that the amount of hydrogen cyanide removed from solution is too small to affect the degree of hydrolysis, and that the whole of the vapour was absorbed by one tube of picrate solution.

MESSRS. W. O. ROBINSON, L. A. Steinkoenig, and C. F. Miller have analysed the ashes of a large number of legumes, vegetables, grasses, trees, and bushes to determine whether the rare elements which have been found in certain soils occur in plants which have been grown on those soils. The results, together with analyses of the soils in question, are published in Bulletin No. 600 of the U.S. Department of Agriculture. Spectroscopic quantities of lithium were found in all the plants examined, and rubidium was present in the majority of cases, the quantity of it being larger than that of other rare alkalis. But plants containing 0·01 per cent. or more of rubidium oxide had been grown on soil in which rare alkali minerals are known to occur. Cæsium was detected in the ashes of timothy grass from Mount Mica, Paris, Me., the red raspberry from Beryl Mountain, Acworth, N.H., and the beets from Marlboro, N.H. Cæsium beryls have been found in the first two of these localities. Molybdenum was never detected; chromium and vanadium were occasionally found, though only in traces. Determinable amounts of barium were found in the ash of all the plants examined, and strontium in all except bean seeds. Very small quantities of titanium were present in the ash of all the plants. All the plant ashes analysed, except two, contained aluminium. Pine needles contain an exceptionally high amount of the latter element. The larger the amount of rubidium and cæsium, but not of lithium, present in the soil, the more is absorbed by the plant. There is no evidence that vanadium replaces phosphorus (as phosphoric acid) in its functions in the plant. The authors conclude that of the elements determined none need be considered in fertiliser practice except those commonly used, and sulphur, chlorine, and manganese in some cases. The appendix to the bulletin contains a detailed account of the analytical methods employed.

MESSRS. H. SOTHERAN AND CO., 140 Strand, have just issued a catalogue (No. 770) of rare and standard books on exact and applied science, which is of exceptional interest and value. It includes the scientific portion of the library of the late Lord Justice Stirling, and selections from the collections of George Rennie, F.R.S.; Samuel Roberts, F.R.S., and other men of science, and gives particulars of a large number of very scarce works. The list is particularly strong in sets of journals of scientific societies. Among many rare volumes we notice the following:—The first edition of the *Opus Majus* of Roger Bacon; the Edizione Nazionale of Galileo's works; Borgo's "Libro de Abacho" (the first edition of the first printed treatise on arithmetic); the first Continental edition of Napier's "Logarithmorum Canonis Descriptio," etc.; the first edition of Gilbert's "De Magnete, Magneticisque Corporibus, et de Magno Magnete Tellure, etc."; the first octavo edition of Newton's "Opticks," with MS. additions and corrections in Sir Isaac Newton's handwriting; and Dalton's "New System of Chemical Philosophy," complete. The catalogue is published at 2*s*. 6*d*. net.

OUR ASTRONOMICAL COLUMN.

GALACTIC CO-ORDINATES.—An interesting article on the galactic circle as a plane of reference for star places is contributed to the February number of *Scientia* by Dr. A. C. D. Crommelin. Following a comparison of the more familiar systems of co-ordinates, it is explained that catalogues of stars giving positions with respect to a plane which is independent of the earth's motions would have the great advantage that they would not get out of date as our present catalogues do, as only small corrections for proper motion would be required. The most obvious circle of reference is that provided by the Galaxy, for almost every feature either of distribution or of motion of the various classes of stars is based on the Galaxy as a plane of symmetry. It is difficult to give precision to the definition of the galactic circle, but from a consideration of eight determinations, Dr. Crommelin suggests that the adopted position of the north galactic pole, for the equinox of 1900, should be R.A. 12h. 42m. 37s., decl. $+27^\circ\ 32'$. It is further suggested that an actual star should be selected to mark the zero of galactic longitude, say α Cygni, which has an extremely small proper motion. The general adoption of some such scheme has been widely advocated, and will doubtless sooner or later be realised.

MOLECULAR SCATTERING OF LIGHT.—In a paper communicated to the Astronomical Society of France (*L'Astronomie,* January), Prof. Ch. Fabry gives an account of Lord Rayleigh's explanation of the blue coloration of the sky, and announces that the theory has been experimentally verified in his laboratory at Marseilles by M. Cabannes. Prof. Fabry suggests that several hitherto mysterious phenomena in the heavens may possibly be explained as effects of this scattering of light by gaseous molecules. In the case of the solar corona, for example, the portion of the luminosity which gives a continuous spectrum does not necessarily imply the presence of solid or liquid particles, but may be attributed to the diffusion of photospheric light by molecules of truly gaseous coronal matter. A density of only one-thousand-millionth part of that of atmospheric air would suffice to account for the observed intensity of the coronal light, and the polarisation of the light would be simply explained, as in the case of the light of the sky. A part of the luminosity of the tails of comets may be explained in a similar manner, and in this case the density must be less than one milligram per 1000 cubic metres, as otherwise the luminosity would be greater than any which has ever been observed. Other possible effects of molecular scattering are also suggested. It may be added that Prof. R. J. Strutt has also succeeded in observing the scattering of light by dust-free air in a laboratory experiment with artificial illumination (NATURE, October 25, 1917).